LowPT: Chasing the Dphi problem

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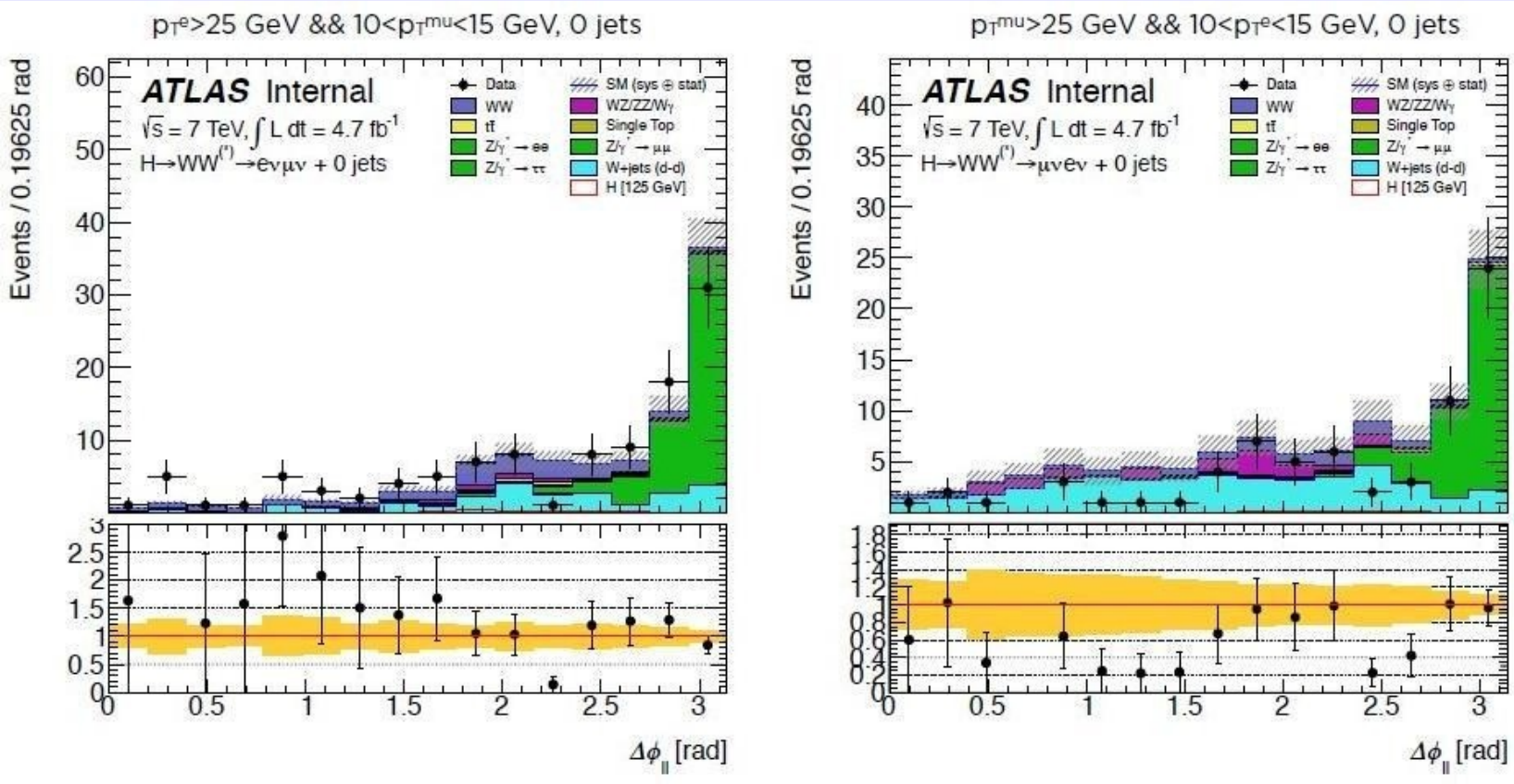
Outline:

Looking at shapes of distributions for data and background in the 2011 sample (2011 analysis)

- Focusing on a few plots for today

E-mu and mu-e channels

- ***Most impressive disagreement between data and expectation is in the plots below. Obtained by vetoing signal events.***
- For the e-mu (left): expect 22, observe 34
- For the mu-e (right): expect 40, observe 17
  (Numbers read off the graphs)



COMMENT ON SLIDE 2.

- If I compare the blinded plot on slide 2, with the unblinded one shown here. I notice that the W+jet contribution on the mu-SubLe (right) has been reduced very little in Dphi<1.8, while the one on the e-muSL(left) has been reduced a lot.
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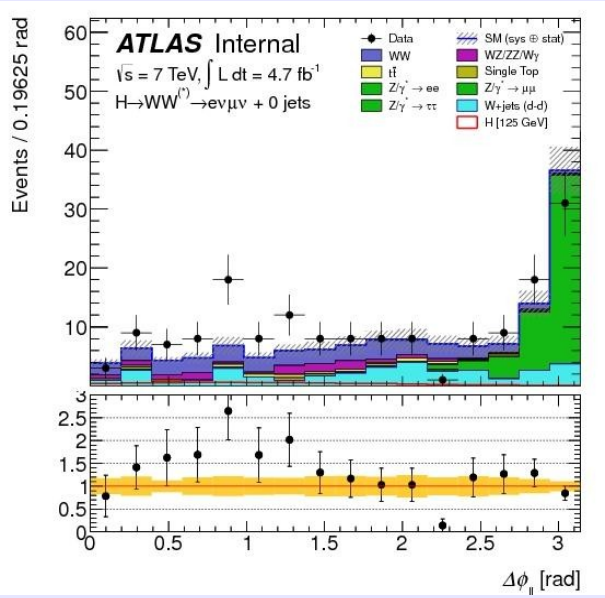
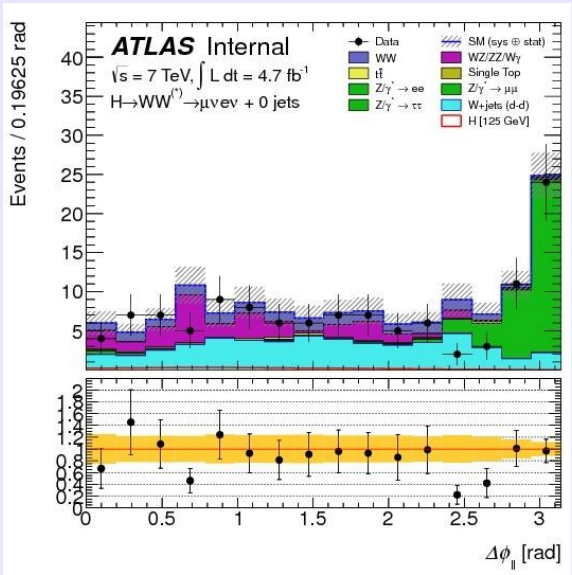
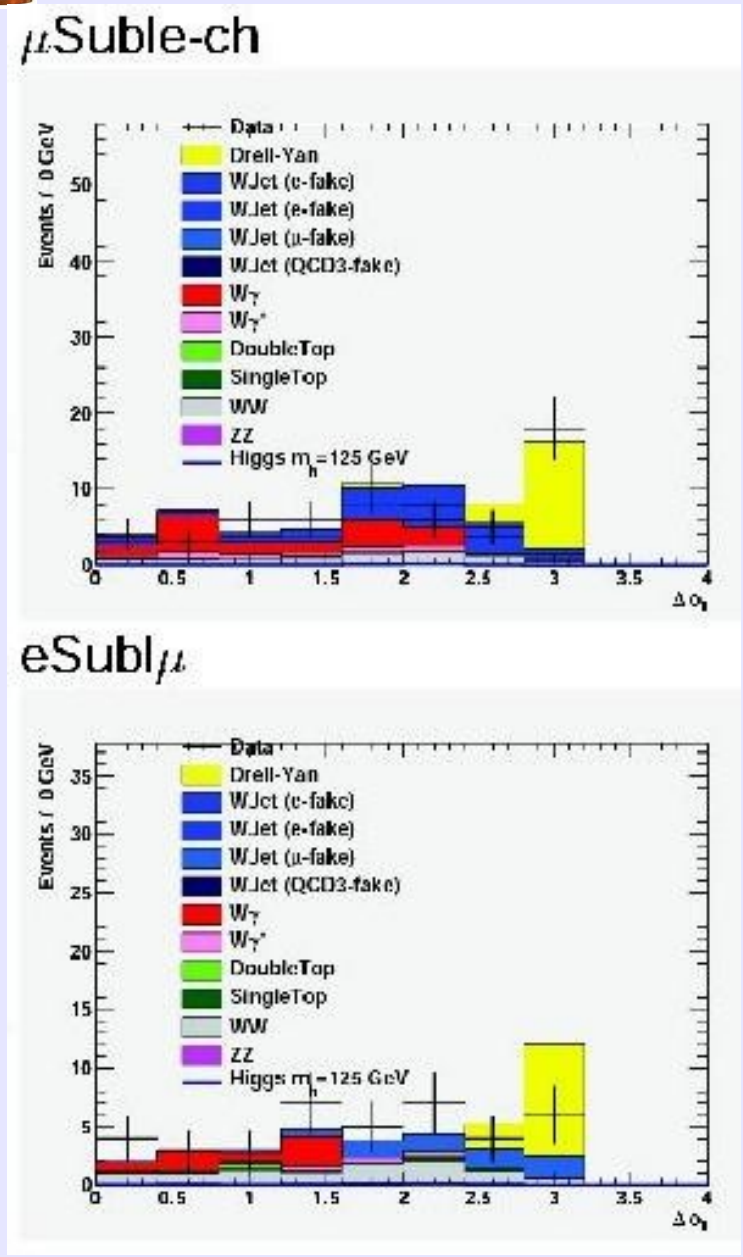
I find: emu 17.0--> 5.7 ratio: 0.34
mue 32.6--> 25.4 0.78

- Our statement that the background in the mu-SubLe is overestimated depends on how this is done.





PENN Reanalysis



- The PENN reanalysis of the 2011 data, shows a different situation. The prediction for both the e-mu and the mu-e channels are very close to the observed values

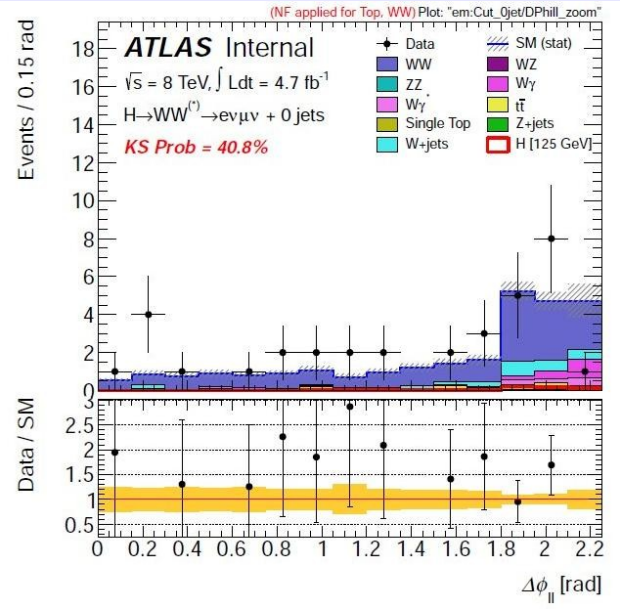
- Counting # of events from the plots for Dphi< 1.8, I get:

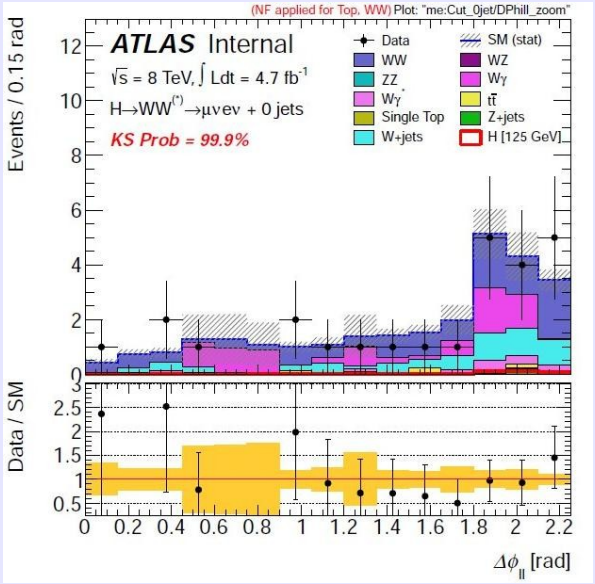
- For the e-mu
  Expect 16.5 observe 22
- For the mu-e
  Expect 30 observe 28

BACKGROUND ESTIMATES LOOK MUCH BETTER!!!

REANALYSIS CAF RESULTS

- From Antonio's files : blinded plots at the Jet Veto Level



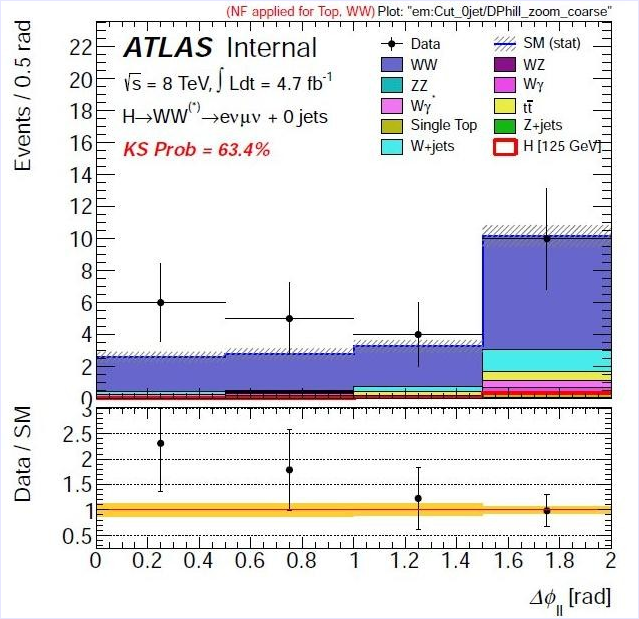


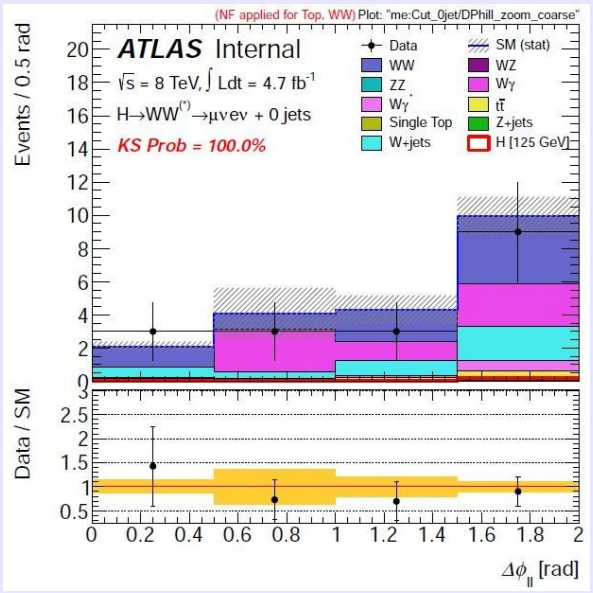
- Counting # of events from the plots I get for DPhi<1.8
- For the e-mu: Antonio Expect **11.2** observe **20** NOT SO GOOD!
  Doug " **16.5** " **22**
- For the mu-e Antonio Expect **10.2** observe **11**
  Doug " **30** " **28**

Quite a disagreement ! Clearly background is different

REANALYSIS COMPARISON

- From Antonio's files : blinded plots at the Jet Veto Level





- Counting # of events from the plots I get for DPhi<2.0
- For the e-mu: Expect **19.4** observe **24** NOT AS BAD!
  For the mu-e: Expect **20.2** observe **17**

Notice, however, that the inclusion of the 1.8-2. bin has washed out the disagreement a bit

Backup Slides

Backup Slides

Flavor Dependence of Excess

Need to understand how Antonio's break trough (contamination of the subleading muons) enters into the excess.

Cutflow for different flavors

Lepton channel	ee	$\mu\mu$	eμ	all
Cut 11				
signal	2.2 ± 0.2	5.1 ± 0.3	13.3 ± 0.9	20.6 ± 1.3
Total Back	159 ± 24	271 ± 33	770 ± 114	1201 ± 170
observed	144	263	828	1235
Jet Veto				
signal	1.4 ± 0.1	3.3 ± 0.3	8.9 ± 0.8	13.6 ± 1.2
Total Back.	41 ± 9	80 ± 15	255 ± 63	376 ± 85
observed	43	81	282	406
$P_{T,\mu} > 45,30$ GeV				
signal	0.76 ± 0.08	1.6 ± 0.2	7.5 ± 0.7	9.8 ± 1.9
Total Back.	9.7 ± 3.1	15 ± 2	90 ± 10	115 ± 14
observed	6	20	117	143
Final Sample, with $\Delta\Phi < 1.8$				
signal	8.9 ± 0.8	0.7 ± 0.1	1.6 ± 1.1	6.6 ± 0.6
Total Back.	9.3 ± 3.0	14.2 ± 2.3	73 ± 8	96 ± 11
Observed	5	**19**	**100**	**124**

excess

excess

No excess in ee, excess in both eμ and μμ

Trigger effect?